Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14ME2046** | **Duration :** | **3hrs** |
| **Sub. Name :** | **METAL CUTTING THEORY AND PRACTICE** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Draw the comparison table and explain the different types of chips during metal cutting operations with neat sketch. | CO1 | 10 |
| b. | In an orthogonal cutting process, the following data were observed. t=0.25mm, Fh=1135 N, Fv= 110 N,rt = 0.47, b=4 mm, V = 30 mm/min , α = 20º. Determine the friction angle, the shear plane angle, resultant cutting force and power. | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | In an orthogonal turning operation cutting speed 80m/min, Cutting force 20kg, feed force 8 kg, Back rake angle 15º, Feed 0.2 mm/rev, Chip thickness 0.4mm. Determine the following i) Shear angle ii) work done in shear iii) Shear strain. | CO2 | 10 |
| b | Differentiate orthogonal and oblique cutting with neat sketch. | CO1 | 10 |
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| 3. |  | Draw and explain the nomenclature of single point cutting tool with neat sketch. | CO2 | 20 |
| (OR) | | | | |
| 4. |  | With mandatory sketch explain the nomenclature of milling cutter. | CO2 | 20 |
|  |  |  |  |  |
| 5. | a. | Explain the various methods of measuring cutting temperature during metal cutting operations. | CO3 | 10 |
| b. | Give brief note on the effect of tool geometry on tool life. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | List out and explain the classification of cutting fluids used in Machining. | CO3 | 10 |
| b. | Write short notes on selection of cutting fluids. | CO3 | 10 |
|  |  |  |  |  |
| 7. | a. | Discuss about different types of tool materials used in industrials and its essential properties and features. | CO5 | 10 |
| b. | Describe the characteristics that are essential for cutting tool materials. | CO5 | 10 |
| (OR) | | | | |
| 8. | a. | What do you mean by Tool life? Explain the tool life with Taylor’s equations. | CO4 | 10 |
| b. | A tool life of 80 mins. is obtained at a speed of 30mpm and 8 minutes at 60mpm. Determine the (i) Tool life equation (ii) cutting speed for 4 mins. Tool life. | CO4 | 10 |
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|  | | **Compulsory:** |  |  |
| 9. | a. | Define Wear. Explain the different types of wears. | CO4 | 10 |
| b. | Write short note on machine chatter. | CO4 | 10 |